Vol. I. APRIL, 1928 No. 2

Journal
OF THE
Kansas Entomological Society

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Subscription, $1.00 per year **Single copy, 40 cents**

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JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY

Publication Office, 119 South Main Street, McPherson, Kansas, W (arren) Knaus, Publisher

A quarterly journal published in January, April, July, and October, devoted to entomology in Kansas and to the proceedings of the Kansas Entomological Society.

The subscription price is one dollar a year payable in advance. Single copies may be had at forty cents.

Manuscripts for publication may be sent to any one of the publication committee.

Subscriptions should be sent to the office of Publication, 119 South Main Street, McPherson, Kansas.

"Application for entry as second-class matter is now pending"
under the Act of March 3, 1879.
January 1, 1928, at the postoffice at McPherson, Kansas.

THE COCCINELLIDAE OF KANSAS (COLEOPTERA)

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The family Coccinellidae, which is a well known and important group of beetles, is represented in almost every Kansas collection of insects. The various species are among our most beneficial insects and because of their predacious habits have become an important factor in the control of aphids, scales and certain other insects. Only one genus, **Epilachna,** the members of which are leaf feeders, is known to be injurious. It is represented in Kansas by a single species.

The purpose of this paper is to list those species known to exist in the state together with information concerning their distribution, habitats, and collection dates. The data are limited and in most cases not sufficient to warrant drawing definite conclusions.

Leng's Catalogue of the Coleoptera of North America is used as a guide. Leng recognizes 362 species and 84 varieties of Coccinellidae, a total of 446; eighty of these are known to exist in the state. Thirteen species and varieties are here reported for the first time from Kansas. With this addition, the number of Coccinellids in this state ranks high as compared with the numbers from other states. For a comparison the numbers from some of the states are as follows: California, 148, (Leng, 1920); Florida, 71 (Merrill, 1922); New Jersey, 64 (Smith 1909); Indiana, 53, (Blatchley, 1910); and Connecticut, 39 (Britton, 1920). The large number of species found in the state seems to be due to its geographical position, which allows for an intermingling of forms from the north, south, east and west, each of which has certain characteristic species. Undoubtedly other species and varieties will be added by more careful collecting, especially among the smaller forms, and a few others may be added from material in the collection of the Kansas State Agricultural College which is still undetermined.

The collections of the Kansas State Agricultural College, Kansas University and Ottawa University and those belonging to Mr. W. Knaus and Mr. F. F. Crevecoeur were studied in the preparation of this paper. All are excellent collections and much valuable data were ob-

tained from each.

The writer acknowledges the courtesies extended by Dr. H. B. Hungerford and Mr. R. H. Beamer of Kansas University and by Professor and Mrs. H. K. Gloyd of Ottawa University in making the collections of their institutions available. Mr. W. Knaus and Mr. F. F. Crevecoeur kindly assisted by submitting the Coccinellidae from their collections. Acknowledgments are due to the faculty members of the Department of Entomology at the Kansas State Agricultural College for aid, suggestions and criticisms offered.

HYPERASPIS Chev.

10874 *(1) **H. lateralis** Muls. Riley *(2) and Pottawatomie Counties, July 7.

10879 **H. signata (Oliv.).** Pottawatomie. Riley, Kingman and Kiowa Counties. Also reported from Wilson County by Knaus (1898). Usually taken on timbered lands, May 24 to July 24.

10880 **H. proba** (Say). Pottawatomie, Saline and McPherson Counties. Reported from Douglas County by Popenoe (1877). Taken on vegetation along streams May 11 to July 7. This species is variable in its elytral pattern, some specimens being without apical pale spots.

10908 **H. fimbriolata** Melsh. Riley and McPherson Counties. Reported from Shawnee and Rooks Counties by Popenoe (1877) and from Morton County by Snow (1903). June 29 to August 30. Thrives under wide range of conditions from sand dunes to upland prairie. It has been taken on various plants, including sorghums.

10923 **H. lugubris** (Rand.). Douglas County. Reported from Shawnee County by Popenoe (1877).

10930 **H. undulata** (Say). Pottawatomie and Riley Counties. Reported from Shawnee County by Popenoe (1877). March 18 to September 23. Taken under pile of lumber at the earlier date. Associated with the green bug on wheat and oats in May.

10934. **H. annexa** Lec. Reported from Kansas by

* (1) Number according to Leng (1920).

*(2) The counties immediately following the name of the species are those from which the writer has seen specimens.

Crotch (1873). A single specimen is found in the K. S. A. C. collection. It bears a Kansas University label and was taken by Dr. S. W. Williston. Popenoe (1877) records it from western Kansas.

10936 **H. quadrivittata** Lec. Riley, Kingman and Kiowa Counties June 26 to August 12. Taken on vegetation on the sand dunes along the Kaw River in Riley County.

10949 **H. pratensis** Lec. Reported from Kansas by Crotch. (1873).

HYPERASPIDIUS Cr.

10954 **H. vittigera** (Lec.). Rooks County July 1 and Pottawatomie County June 25. Reported by Snow (1878) (1903) from Hamilton and Clark Counties. Taken on weeds in or near timber land.

10959 **H. insignis** Csy. A single specimen is found in the K. S. A. C. collection from Meade County. May 15. Identified by E. A. Schwarz.

10961 **H. militaris** (Lec.). Knaus (1885) reports this species from Douglas County.

BRACHYACANTHA Chev.

10967 **B. dentipes** (Fab.). Douglas, Pottawatomie, Riley and Clark Counties. Popenoe (1877) reports it as common in eastern Kansas and Snow (1903) reports it from Clark County. Has been taken from oak trees, on alfalfa and on weeds. Collected in May.

10967a **B. dentipes socialis** Csy. Casey (1899) describes this variety from Kansas.

10971 **B. tau** Lec. Riley County. One specimen in the K. S. A. C. collection taken July 13 by E. A. Popenoe. The species was described by Leconte (1859) from Ft. Riley, which is in Riley County. Another specimen without data is in the Kansas University collection.

10972 **B. ursina** (Fab.). Douglas, Wilson, Riley and Phillips Counties. May to September. Popenoe (1877) reports it as frequent in eastern Kansas. Has been collected on weeds and on plum trees.

10974a **B. felina decempustulata** Melsh. Pottawatomie and Riley Counties. May, June and July. Pope-

noe (1878) reports it from Douglas County and Snow (1903) from Clark County. Usually collected on weeds.

10975 **B. bolli** Cr. Shawnee, Pottawatomie and Riley Counties. Collected in May and June.

10979 **B. quadripunctata** Melsh. Douglas County. Popenoe (1877) reports it from Douglas County as **B. ursina basalis** Melsh. Snow (1881) reports it again from Douglas County.

10981 **B. albifrons** (Say). Riley County. Taken in June on upland. Popenoe (1878) reported it from western Kansas and Snow (1903) from Clark County.

10983 **B. pacifica** Csy. Riley County. June 1. Collected from upland.

MICROWEISEA Ckll.

10989 **M. misella** (Lec.). Pottawatomie and Sedgwick Counties March 6 and May 19. Popenoe (1878) reported it from Douglas County. Peairs and Merrill (1916) state that it is present in the state as an enemy of San Jose scale.

STETHORUS Weise

10998 **S. punctum** (Lec.). Pottawatomie County, May 11 to October 23. Casey (1899) recorded this species from Kansas.

SCYMNUS Kug.

11006 **S. flavescens** Csy. Pottawatomie County July 11. A single specimen taken by F. F. Crevecoeur.

11011a **S. creperus fraternus** Lec. Riley County May to July. Very rare. F. A. Marlatt and R. C. Smith, collectors.

11012 **S. brullei** Muls. Recorded from Kansas by Horn (1895).

11013 **S. haemorrhous** Lec. Pottawatomie and Riley Counties April 21 to November 5. Popenoe (1877) reported it from Shawnee County and Knaus (1908) reported it from Pottawatomie County. It has been taken in orchards and timberlands and has been beaten from Buckeye bloom.

11013a **S. haemorrhous divisus** Csy. This species is de-

scribed from Kansas by Casey (1899).

11015 **S. rubricauda** Csy. Riley County July 17 to September 24. Casey (1899) described this species from Kansas.

11018 **S. cervicalis** Muls. Gove County. The specimen in the Kansas University is probably the remaining one of the collection which Snow (1878) reported from that county.

11019 **S. kansanus** Csy. Casey (1899) describes this species from Kansas.

11024 **S. caudalis** Lec. Barber County August 26. Popenoe (1877) reports it from Shawnee County.

11028 **S. collaris** Melsh. Pottawatomie, Wilson, Riley and Republic Counties. Knaus (1885) states that it is common in Saline County May 8 to September 11. Shows a preference for wooded lands.

11055 **S. tenebrosus** Muls. Riley County May to September. Predacious on the woolly apple aphid **(Eriosoma lanigera).**

11071 **S. cinctus** Lec. Pottawatomie and Riley Counties July to November 28. Knaus (1887) reported this species from Saline County. On November 28 it was taken in hibernation under stones.

11077. **S. punctatus** Melsh. Reported from Douglas County by Popenoe (1878) and from Pottawatomie County by Knaus (1887).

11079 **S. nanus** Lec. This species is reported from Douglas County by Snow (1881).

11082 **S. americanus** Muls. Riley County, August. It has been taken in Douglas County according to Popenoe (1878). In Riley County it has been taken on lowland vegetation.

11088 **S. phelpsi** Cr. Pottawatomie County May 8. Taken on weeds in timber. Knaus (1901) records it from Republic County.

11092 **S. bisignatus** Horn. Reported from Reno County by Knaus (1907).

11093 **S. flavifrons** Melsh. This species is reported from Douglas County by Popenoe (1877).

11093a **S. flavifrons bioculatus** Muls. Pottawatomie and Kiowa Counties in May. Has been taken on **Symphoricarpos vulgaris** Michx.

11097 **S. amabilis** Lec. A southern species reported from Wallace County by Snow (1878).

11104 **S. intrusus** Horn. Pottawatomie County January 28 to June 18. Knaus (1885) states it is rarely taken in Saline County. At the earlier date it was taken in hibernation under stones and at the last date on a hedge.

11115 **S. terminatus** Say. Pottawatomie and Riley Counties. May 11 to July 13. Popenoe (1878) reported it from Douglas County. Collection records show that it has been taken on the lowlands.

11121 **S. dulcis** Csy. This species has been described from Kansas by Casey (1899).

DELPHASTUS Csy.

11143 **D. pusillus** (Lec.). Douglas, Shawnee and Pottawatomie Counties. First reported by Popenoe (1877) from Shawnee County and later by Knaus (1903) from Pottawatomie County. May 27 to July 18. Taken on weeds and grass.

PSYLLOBORA Chev.

11150 **P. viginta-maculata** (Say). Douglas, Wilson, Pottawatomie, Riley and Reno Counties. May to September. First reported in the state by Popenoe (1878). Specimens from Pottawatomie County were taken in the timber.

MACRONAEMIA Csy.

11156 **M. episcopalis** (Kby.). Reported from Kansas by Crotch (1873) and Leng (1903).

CERATOMEGILLA Cr.

11158 **C. fuscilabris** (Muls.). Very plentiful throughout the eastern half of the state. There are no collection records west of Harper County. February to November. The most common species on corn in Riley County in August and September. Has been taken on cocklebur. Reported by Popenoe (1877).

11159 **C. vittigera** (Mann.). Crotch (1873) reports this species from Kansas.

HIPPODAMIA Dej.

11162 **H. tredecim-punctata.** (L.). Douglas, Pottawa-

tomie, Reno, Riley and McPherson Counties. March 30 to July 28. Taken on prairie grass, corn, wheat, alfalfa and on plum trees.

11163 **H. parenthesis** (Say). Taken throughout the state in relatively large numbers. Thrives under wide range of habitat and has been taken on many species of plants. Popenoe (1877) reports it from Douglas and Morton Counties.

11165a **H. sinuata spuria** Lec. Knaus (1903) reports this variety taken in McPherson County at electric lights. Rare. Leng (1903) had a specimen from Kansas.

11165b **H. sinuata complex** Csy. Another rare variety. Taken in McPherson County. Reported by Knaus (1903).

11168 **H. americana** Cr. Described from Kansas by Crotch (1873).

11171 **H. gracialis** (Fab.). Distribution statewide. January 27 to November 29. Found on many crop plants and weeds. Hibernates under rocks. Popenoe (1877) first reported statewide distribution and Snow (1878) reported it from Gove and Wallace Counties.

11172 **H. quindecim-maculata** Muls. Riley County. Recorded from Douglas County by Snow (1883). Somewhat rare. Taken on corn and sorghum plants. July 13 to September 3.

11173 **H. convergens** (Guer.). The most common of all species and occurs throughout the state. March 6 to November 23. It may be found on all kinds of vegetation. Seems to have no preference of habitats. Found in hibernation under bark, from cottonwood trees. Popenoe (1877) states it is the most abundant species in western Kansas where it is found on Helianthus and other strongly scented herbaceous plants. Snow (1878) and (1903) lists it from western Kansas counties. The species varies from the immaculate form to those with six very prominent elytral spots.

11174. **H. lecontei** Muls. Pottawatomie County. A single specimen seen. Also reported from there by Knaus (1901).

11175 **H. quinquesignata** Kby. Riley County July 4. Only one specimen seen, this being in the K. S.

A. C. collection. Taken on corn by Hayes and McColloch. Popenoe (1878) lists this species without data.

NEOHARMONIA Csy.

11178 **N. venusta** (Melsh.) Pottawatomie and Riley Counties. Knaus (1901) has recorded it from Reno County June 3 to December 22. Most of the collection records indicate that it is usually taken in hibernation or in hiding under bark, leaves and cloth bands on trees. It has been taken on weeds. Quite rare.

COCCINELLA L.

11183 **C. tricuspis** Kby. Reported by Knaus (1901) from Kansas.

11184 **C. novemnotata** Hbst. Douglas, Shawnee, Pottawatomie, Riley, McPherson, Saline, Logan, Wallace and Gove Counties. Popenoe (1877) reported it as common in eastern Kansas and Snow (1878) from Wallace and Gove Counties. February 2 to November 23. It occurs frequently on corn and has been taken on many other kinds of plants. Hibernates under stones.

11185 **C. tranversoguttata** Fald. Douglas County. One specimen in the Kansas University collection taken by Snow.

11185a **C. transversoguttata quinquenotata** Kby. Popenoe (1877) lists this variety as occurring in western Kansas.

11187c **C. monticola prolongata** Cr. First reported from Kansas by Knaus (1908). The writer has seen a single specimen from Wallace County. Probably confined to the western part of the state.

CYCLONEDA Cr.

11190 **C. munda** (Say). Douglas, Franklin, Pottawatomie, Riley, Saline, McPherson and Hamilton Counties. Common in central and eastern Kansas but seems to be less plentiful in the western part of the state. April 18 to November 9. Where present in large numbers little preference seems to be shown for habitat. It is probably this species that has been reported by Pope-

noe (1877) and Snow (1878) as **C. sanguinea** (L.). These writers may have been mistaken in their identification, an error which is likely to occur unless both forms are familiar to the worker. **Sanguinea** is a tropical and sub-tropical species.

OLLA Csy.

11192 **O. abdominalis** (Say). Doniphan, Douglas, Franklin, Wilson, Pottawatomie, Riley, Sumner, Saline, McPherson, Logan and Wallace Counties. Snow (1878 and 1903) reports the species from Gove, Hamilton, Morton and Clark Counties. April 18 to October 30. Popenoe (1877) states that it occurs in central and eastern Kansas in numbers equal to **plagiata** but more recent collections indicate that it is more numerous. Has been taken on corn, sorghum, small grains, alfalfa, shade trees and various weeds and its habitat varies from swamps to upland prairie. Casey (1899) was unable to detect any noteworthy variation of any kind but two specimens were collected by Crevecoeur in Shawnee County on September 10, 1901 and one by Smith in Riley County on alfalfa September 8, 1925, on which the anterior transverse row of four dots is normal on each elytron, the submarinal spot of the middle row normal, the two inner being enenlarged and coalesced, roughly forming a triangle with its apex near the inner side of the sub-apical spot to which it is narrowly joined. The base or anterior side of the triangle is sinuate. This seems to be an intermediate form between **abdominalis** and the variety **plagiata,** or it may be a distinct form of at least varietal standing.

11192a **O. abdominalis plagiata** Csy. Shawnee, Riley, Meade, Ford and Wallace Counties. Popenoe (1877) reports this variety under the name **oculata** Fab. as plentiful in Shawnee County and Snow (1903) reported it from Hamilton and Morton Counties. May 8 to August 25.

ADALIA Muls.

11193 **A. bipunctata** (L.). Douglas, Pottawatomie, Riley and Morris Counties. Previously reported

from Douglas County by Popenoe (1877). April 11 to November 8. Predacious on **Aphis maidis** Fitch. Has been taken on corn, sweet corn, alfalfa, soft maple and sweet peas. Enters buildings in fall for hibernation.

11194 **A. frigida** (Schn.). Leng (1903) reports that this species occurs as far south as Kansas.

11195a **A. annectans duplicata** Leng. Neosho County. Represented by a single specimen in the University of Kansas collection.

ANATIS Muls.

11202 **A. quindecimpunctata** (Oliv.). Wilson, Pottawatomie, Riley, Ford and Wallace Counties. Popenoe (1877) records it from eastern Kansas. March 1 to August 20. Predacious on aphids on elm trees, also taken on plum trees, on corn plants and in timber land. Hibernates under stones, etc.

AXION Muls.

11211 **A. pilatei** Muls. Reported from Douglas County, by Popenoe (1878).

11212 **A. tripustulatum** (DeG.). Douglas, Pottawatomie, Riley and Republic Counties. Reported from Kansas by Popenoe (1877). May to July. Has been reared from larvae taken on oak leaves where it was predacious on Kermes scale.

CHILOCORUS Leach

11217 **C. bivulnerus** Muls. Doniphan, Douglas, Franklin, Neosho, Pottawatomie, Riley, McPherson, Meade and Wallace Counties. Also reported from Shawnee County by Popenoe (1877). March 6 to July 18. Seems to perfer orchards. Popenoe has taken it in Meade County on **Ipomoea leptophylla.**

EXOCHOMUS Redt.

11220 **E. marginipennis** Lec. Douglas County. Snow (1881) reports this species from Douglas and Leavenworth Counties.

11220a **E. marginipennis childreni** Muls. Pottawatomie County June 12. Snow (1881) reports it from Douglas County. Taken on weeds be-

tween corn field and timber.

EPILACHNA Chev.

11229 **E. borealis** (Fab.). Pottawatomie, Riley and Wilson Counties. Reported from Douglas County by Popenoe (1877). June 12 to December 26. Taken in hibernation under bark and stones on Blue River bottom. Collected from **Sicyos angulatus** L. in timberland in June and July.

11231 **E. corrupta** Muls. Crosby and Leonard (1918) state that this species occurs in Kansas. Leng (1920) does not include the state in its distribution and its occurrence in Kansas is doubtful.

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LASIUS INTERJECTUS MAYR (FORMICIDAE), A Household Pest in Kansas. *

By

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This species of ant has been reported and specimens identified from about a dozen homes in Kansas in the last seven years. It is a species about which relatively little is known. Since it appears to be a new household pest and is apparently on the increase in this connection in this state, these biological notes may prove of general interest.

Review of Literature

This ant was described in 1866 by Mayr, under the name of **Acanthomyops interjectus.** Specimens are at hand from various parts of Kansas and from Ithaca, N. Y. These records, together with localities reported in papers mentioned herewith, indicate that the ant has a wide distribution including the greater part of the United States.

Virtually all that is known about this "yellow ant", as it has been called is contained in the brief notes by Joseph Leidy. He found this ant, which he reported (1877) as **Formica flava** under stones in possession of several species of aphids of which he mentions an Aphis and Coccus. These were kept in distinct herds. Both adhered to the stones and were not attached to roots, but were carefully attended by the ants. They were without visible means of subsistence except possibly the grassroots "to which they were at times probably transferred by their masters." In a note later (1882) he reported finding this ant, which he lists as **Lasius interjectus,** frequently under stones on his collecting trips and that it habitually cared for these two species of Aphis and Coccus. He described finding six groups of aphid colonies and five of a red Coccus under one stone.

Wheeler (1916) in "The Hymenoptera of Connecticut" points out the rather agreeable odor which he says is like lemon verbena. He says this species "leads a subterranean aphidicolous existence. **L. interjectus** is the largest species of the genus. It is found nesting in old

logs and stumps in open woods and occasionally makes rough mounds or merely excavates its galleries under large stones." It occurs in Connecticut.

Wheeler (1917) lists this species from Pullman Washington, several localities in Colorado; Las Vegas, New Mexico, and Flathead Lake, Montana. He states that "Specimens from these localities of all three phases are indistinguishable from those of the central and eastern states where the species is much more common. It nests in dry, sunny places." He describes four subspecies from the above localities.

Smith (1918) expresses these same ideas and says further that this species is one of the most common species in South Carolina. This ant was first reported for Kansas by Tucker (1908) from Lawrence, but only workers were seen. Hayes (1925) referred to this record and also to certain occurrences at Manhattan which are included within the scope of this paper.

M. R. Smith reported in the Insect Pest Survey under date of March 23, 1926, that the sexual forms had appeared by the hundreds in some homes and greenhouses at Urbana, Ill. The winged forms were observed particularly during January and February. The nests appeared to be in the ground under the basement.

OBSERVATIONS IN KANSAS

The first opportunity to observe this species was during the emergence of a swarm in the basement of the writer's house on April 12, 1921. At that time both the winged and wingless forms emerged in large numbers through a crack in the basement floor near the furnace. This portion of the cellar was rather dark at all times. Winged and wingless forms often would be observed apparently resting on the small accumulation of sand or soil which they brought up or on the cement near the crack. Several times during the year the winged forms crawled about the basement and a few were attracted to the lights. This constituted about the only objection to their presence. In the evening, while reading near a light, these winged ants would alight upon one and their crawling was somewhat obnoxious. Walking or running was a more frequent mode of locomotion than flying.

The swarming out of the winged forms, which, in this case, means the scattering from the place of emer-

gence in the cellar chiefly by crawling, occurred most frequently in the spring, especially on bright sunshiny days following rains. Termites were often emerging and seen in flight on the same days. They often began quite early in the year as in February or March and continued at possibly two months intervals until in October or November.

Wheeler (1914) states that the typical **Lasius interjectus** winged forms are not found in the United States until the middle of July and until the middle of September. There is, therefore, perhaps some connection between the earlier swarming here reported and their nesting place.

The ants were most active, however, in the spring and several times during March and April, especially, they could be seen crawling about the basement, and outside the house in the lawn or over the foundation. They were practically confined to the south side of the house. The wingless forms almost never wandered more than a few feet from the emergence opening. The winged forms always appeared fresh and bright, as if they had recently reached the adult stage.

One day in 1921, when the ants were crawling about the basement in large numbers and many were resting near the emergence opening, the writer allowed a hen with a dozen young chicks to feed upon them. The ants were eaten greedily with frequent chirps of satisfaction and without any ill results.

When these ants were eaten by the chicks, or when they were mashed, a very strong not unpleasant odor was apparent. The odor reminded one of certain toilet soaps. The odor was so marked always as to excite the writer's curiosity as to its nature and origin. Some ants were taken to Dr. C. W. Colver, Professor of Chemistry, who had some advanced students distil them with steam and identify the acids. They found that the acidity was due to formic acid and that the odor was due to a steam volatile substance which is not acid in character. The substance which gives the distillate its characteristic odor seems to be very volatile, for the odor disappears rapidly. It was found that the odor was most pronounced when the ants heads were mashed though it could be clearly detected from the thorax and abdomen.

It was decided during the spring of 1927 to attempt to find the nest of these ants so the cement floor around the crack was broken and removed for a distance of

about two feet. No trace of any nest was found. The cement had been laid on a base of rather fine sand, so it is presumed that they had come a minimum distance of possibly eight feet under the cement through a narrow tunnel from outside the house. The floor was recemented and their place of emergence closed. In a few weeks the ants were observed emerging from near the outside cellar door where the floor joined the door jam. They never emerged in very large numbers there. In October cement steps were put in and this place of emergence closed. This has proved to be a permanent control, for the ants have since emerged only outside the cellar near the south foundation wall.

These ants are reported so often by correspondents that we always suspect this species when persons write in about ants in their basements and indicate that they are not termites. At least seven residences have been seen in Manhattan where the ants emerged in a similar way to that described. They are often seen emerging from the soil near the foundation and crawling about over the foundation or vegetation. Specimens of this species from houses where their behavior was much as described here have been sent in from Iola, LaCrosse, McPherson, Kansas City and Kinsley, Kansas, by correspondents. Prof. J. W. McColloch of this department, has observed it under stones of this vicinity, but reports it as not common.

Injury or Damage Caused

No one has yet reported them damaging the timbers of residences. Certainly in the writer's basement they did not attack wood. In fact, there was no wood nearer than four feet from their place of emergence. Their damage is wholly the carrying in of soil which in all but one house observed was really inconsequential and their crawling about the house or over one's person. They do not bite or sting.

We need to know whether this species feeds primarily or wholly on aphid excretions and where it builds its nest. The ants observed never appeared hungry and were never observed to take any food, not even water. Their bodies were full of a clear liquid which resembled the so-called honeydew of aphids.

Control Measures

When the ants were observed in numbers near the

place of emergence, they were readily killed with a little boiling water. This, of course, did not reach the nest and, therefore, the control was only temporary. Calcium cyanide sprinkled about the place of emergence also killed them promptly, but gave only temporary control. Filling the cracks with cement or asphaltum is an effective way of keeping them out and at this time, it is the only effective preventive known. The writer is of the opinion that the nest is located a considerable distance from such points of emergence, perhaps around some trees or bushes in the yard or under cement walks. Acknowledgement is made to Dr. M. R. Smith for the determination of these specimens.

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DISPERSAL OF SCARABAEIDS BY FLOOD WATERS.

By

J. W. McCOLLOCH, Kansas State Agricultural College

Fresh water streams are generally recognized as an avenue of dispersal for many insects. This is especially true during periods of high water following heavy rains. A number of collections have been made at the Kansas Agricultural Experiment Station of the May Beetles and related species being carried by high water. These collections indicate that flood waters may be a factor in the dispersal of many Scarabaeids.

Following a hard rain on June 13, 1916, a collection was made of the Scarabaeids being carried in the run-off water coming down a small gully from the hills north and west of Manhattan. Seventeen specimens were secured in this collection, as follows:

Phyllophaga implicita	**9**
Phyllophaga rugosa	**4**
Phyllophaga crassissima	**1**
Phyllophaga lanceolata	**1**
Ligyrodes relictus	**2**

During the flood on the Kansas river in 1923, an attempt was made to determine the Scarabeids, being carried in the drift coming down the river. Collections were made at Manhattan on June 7 and 9 and a total of 28 specimens representing nine species were secured. The data are tabulated as follows:

Phyllophaga hirtiventris	**12**
Phyllophaga vehemens	**3**
Phyllophaga bipartita	**3**
Phyllophaga corrosa	**2**
Phyllophaga implicita	**2**
Phyllophaga hirticula var. **comosa**	**2**
Phyllophaga rubiginosa	**1**
Ligyrus gibbosus	**2**
Cremastocheilus nitens	**1**

The collecting of **P. hirtiventris** was of particular interest, since this species has never been taken in Riley county.

One specimen of **P. hirticula comosa** and one **P. hirtiventris** had eggs of the Tachinid parasite, **Cryptomeigenia theutis** Walk. on the thorax. The eggs

eventually hatched.

All of the beetles were alive when taken from the drift and in several cases, eggs were obtained for life history studies.

THE NORTHWARD EXTENSION OF AGRYPNUS SALLEI LEC.

By W. KNAUS, McPherson, Kansas.

For a number of years in August and September, I have collected in the Sandhills southwest of Medora, Kansas, a large dark brown Elaterid, measuring from 25 to 28 millimeters in length, and 5 to 6 millimeters in elytral width at widest portion.

They were taken feeding on the juices of decaying watermelons, or hiding under the melons, or feeding on the exudation of sap from broken willow branches.

The specimens were tentatively identified as Orthostethus infuscatus Germ., a southern Atlantic and Gulf species which they superficially resembled. The latter part of December 1927 specimens were sent to M. C. Lane at Toppenish, Washington, who specializes in Elateridae. He wrote that the specimens were surely not O. infuscatus but belonged to the genus Agrypnus, and were probably Agrypus sallei Lec., described from Texas.

The chief distinction between Agrypnus and Orthostethus, lay in the antennal sinus on each side of the ventral surface of the prothorax, the sinus extending from near the central portion of the ventral surface upward and outward.

The ventral sunus is not present in Orthostethus. To make sure of the identity of the Medora specimens, examples were sent to the Museum of Comparative Zoology at Cambridge, Mass., where Le Contes types are deposited and Mr. Nathan Banks of the Museary, made the comparison and found that the Medora examples of Agrypnus were identical with the Le Conte tpye from Texas.

Agrypnus sallei Lec. is thus added to the Kansas list of Coleoptera, and the Medora Sandhill region, is undoubtedly the northern extension of this southern species.

I also have in my collection an example of Orthostethus infuscatus from Douglas County, Kansas, and an example is also in the collection of the State University of Kansas. This species also occurs in all the Gulf and South Atlantic States.

KANSAS ACADEMY OF SCIENCE MEETINGS
April 13 and 14
Wichita, Kansas

1. The Chamber of Commerce of Wichita has promised transportation from the Union Station to the Campus for those who go by train to Wichita for the Academy meetings.
2. A tour of the city on Friday afternoon at 4:30 has been arranged by the Chamber of Commerce.
3. The local committee has arranged for a banquet Friday evening. Lunch Friday noon will be at the High School and perhaps the sessions on Friday afternoon will be held in the High School Building. The other sessions will be held at the University of Wichita.
4. The local committee is making every arrangement that seems possible to make the stay of those people attending the Academy a pleasant one.

FOURTH ANNUAL MEETING OF THE KANSAS ENTOMOLOGICAL SOCIETY.

The Fourth Annual Meeting of the Kansas Entomological Society will be held on Saturday, April 14th, 1928, at the University of Wichita, in University Hall, Eighteenth and Fairmount. The Business Session will be held at 9:00 o'clock A. M., and the afternoon session for business and the reading of papers, will be at 1:30 o'clock.

Those members, arriving in Wichita Friday afternoon, and wishing to make reservations for rooms, should consult Miss Hazel E. Branch at the University, or they can make reservation by letter in advance of the meeting.

A Constitution for the Society will be adopted at this meeting and other business of importance will come before the Society. Members are urged to be present.

W. KNAUS, President
R. L. PARKER, Secretary.

Proceedings of the Kansas Entomological Society.

MINUTES OF THE SECOND ANNUAL MEETING.

The second annual meeting of the Kansas Entomological Society was held at Lawrence, Kansas, April 24, 1926. The meeting was called to order at 11:00 a. m., with President Lawson in the chair.

Following a few remarks by the President, Professor Dean and Doctor Hungerford introduced the various people in attendance.

An informal program was then taken up.

The literature of Kansas insects was discussed by J. W. McColloch, and the insect collection at the Kansas State Agricultural College was reported on by R. C. Smith.

Adjourned at noon to meet again at 2:00 p. m.

At this time a group photograph was taken, after which the visitors were entertained at luncheon by the Lawrence entomologists.

The afternoon session was called to order at 2:15 p. m.

Lyle Stephenson told of his efforts to establish a natural history museum in Kansas City, and to interest the public in the natural sciences.

Moved that a committee be appointed to work out a radio program for the dissemination of information on the natural sciences through the radio stations at Lawrence, Manhattan, Kansas City, Mo., and Columbia, Mo. The motion carried.

President Lawson appointed on this committee:

Lyle Stephenson, Chairman

H. B. Hungerford

G. A. Dean

It was also decided that the committee could be enlarged at the discretion of the members.

At this time the Chair appointed as a nominating committee:

H. R. Bryson

Paul Gilmer

P. A. Readio

Informal talks were given by:

R .L. Parker

L. M. Gates

H. H. Schwardt

R. C. Smith

Paul Gilmer

G. A. Dean

R. H. Beamer

H. B. Hungerford

The nominating committee made the following report:

For President, R. C. Smith

For Secretary, R. H. Beamer

On motion, the report of the committee was accepted and the officers recommended were elected by acclamation.

Adjournment.

J. W. McColloch, Secretary.

MINUTES OF THE THIRD ANNUAL MEETING.

The third annual meeting of the Kansas Entomological Society was held at Lawrence, Kansas, April 14, 1927. The meeting was called to order at 11:00 a. m., by President Smith.

Following a few informal remarks by the president, Professors Hungerford and Dean were asked to introduce the various people in attendance.

The work of the committee on a Radio School was reported by Professors Hungerford and Dean.

A motion was made that the report be accepted and the committee be retained. The motion carried.

Meeting adjourned for lunch at the University Commons, to convene at 2:00 p. m.

The afternoon meeting was called to order at 2:10.

The following program was taken up:

1. New and Unusual Distribution Records of Insects for Kansas. (Each one present to be called upon to discuss some order or group with demonstration of specimens, if possible).
2. Additional Outlets for the Publication of the Larger Papers on Kansas Insects.
—Dr. Hungerford.
3. Organization of a Joint Fossil Collecting Trip to Fossil-bearing Fields.—R. H. Beamer.
4. The Season's Outlook in Kansas for Economic Losses Due to Insects.—J. W. McColloch.
5. Informal Reports of Activities on Research Projects.—Led by Prof. Dean with reports of all those present

The following business was intermingled with the regular program:

Mr. W. Knaus, gave the report of the committee on State List of Kansas Insects. It was recommended definite families be assigned to individuals and reports made at the next meeting.

It was moved that the report be accepted and the committee continued. The motion carried.

A motion was made to have a committee appointed to confer with a committee from the Kansas Academy of Science on having a tract of land set aside at Medora, Kansas, for a monument to science and the preservation of wild life. The motion carried. Mr. J. W.

McColloch and W. Knaus were appointed on this committee.

A motion was made to attempt a publication of the proceedings of the Kansas Entomological Society. The motion carried.

A motion was made that the President appoint a committee to sponsor this publication. The motion carried. The president appointed the following committee: Paul B. Lawson, chairman; J. W. McColloch, W. Knaus, Hazel Branch, and H. H. Nininger.

A motion was made that this society go on record as favoring a uniform building code that will prevent termite damage. The motion carried.

Mr. Knaus presented a photograph of T. R. Ashton, one of the earliest entomologists of Kansas, to the Society along with some letters from Mr. Ashton. He also presented a paper from Tuscon, Arizona, which gave an account of one of Prof. F. H. Snow's collecting trips to Arizona.

The nominating committee reported Mr. W. Knaus for president and R. L. Parker for secretary for the coming year.

It was moved that the secretary cast the unanimous vote of the society for these men. The motion carried.

Two letters, one from the University of Wichita, and one from the Wichita Chamber of Commerce, were read by Dr. Hazel Branch, inviting the Society to meet in Wichita next year. Decision on a meeting place for next year was withheld until the Kansas Academy of Science decided upon its place of meeting. The officers were empowered to act.

R. H. Beamer, Secretary.

Volume I. No. 1. Mailed January 1st, 1928
Volume I. No. 2. Mailed April 4th. 1928